

# How to Become a ‘Rat Whisperer’ — 7 Tips on Handling Lab Rodents

by **Kenneth E. McCarson, PhD**

*The expert principal investigator with years of experience trains a new rotating graduate student how to perform intraperitoneal injections in the rat, using techniques his mentor taught him 30 years before. The new staff member, unsure and inexperienced but now “trained,” is charged with injecting 30 rats the very next day. By the next afternoon, the student is ready to move to a different laboratory, the rats have all received various doses of drug, and the Laboratory Animal Resources (LAR) veterinarian contacts the PI to find out why several of his animals now display signs of stress or injury. All three researchers, as well as the research subjects, are stressed, and ultimately the science suffers.*

Does this scenario sound familiar?

Is your rodent research compromised by inexperienced training, limited practice, and unhappy handlers and subjects? That’s common in today’s research environment. In an era that emphasizes reductionist approaches, life scientists often are neither trained nor encouraged to handle animals with skill.

Today’s rodent-driven research originally grew largely out of behavioral research conducted in psychology departments where rats were more often used in longitudinal behavioral studies. But today’s scientists using rodents in their research often focus on tissue collection and molecular biology, and may have relatively underdeveloped rodent-handling expertise. Over the last 20 years or so, much of the emphasis on researchers learning and perfecting these skills has been discarded.

The ability to learn to handle rodents skillfully doesn’t require any special talents. The techniques used by successful animal researchers that minimize pain and distress are learned through expert training, nurtured through ongoing education and skill development, and executed by engaged staff and students. Becoming a “rat whisperer” is not beyond the reach of the invested researcher.

Arguably the original “Rat Whisperer” was Ian Q. Whishaw, PhD, co-editor of *The Behavior of the Laboratory Rat*.<sup>1</sup> He was known to say, “Rats are just little people without socks and shoes.” His research and that of others confirmed much of what owners of pet rats have long known to be true: Rats are intelligent, social animals. And they aren’t just big mice. Besides the family-group social interactions that mice have, rats are colony animals that recognize multiple individuals and have an incredibly complex behavioral repertoire that provides useful models of complex human behaviors in many research scenarios.

Accordingly, the way in which rats and other small-mammal research subjects are handled, even briefly, can have a huge impact on the accuracy and reproducibility of the studies that depend on them. Pain and distress that are not explicitly planned aspects of a research study equal bad

science. Stressed subjects beget variability in research results; inexpert animal handling stresses both the subjects and the research staff, who can end up frustrated, bitten, and potentially acting out in retaliation to fractious animal subjects. Several strategies can be used to successfully avoid these pitfalls.

## **7 techniques of true ‘rat whisperers’**

1) **Educate yourself.** Pursue specific training in the handling techniques you intend to use. Expand/update your training regularly. Don’t just make up new procedures you need to use from a cookbook description – visit a laboratory where the techniques are in regular use to learn them hands-on with active training.

2) **Practice.** Like your golf swing, animal handling skill will erode if not practiced regularly. Realize that the animal-handling training provided by most institutions is just an introduction. Repeat the training, several times if necessary, to gain adequate skill levels. The goal is to reduce your discomfort and increase your confidence in handling animals. Animal subjects can sense the nervousness of a novice or out-of-practice handler.

3) **Be friendly.** Handle your subjects early and often. Animals that are not handled routinely, especially those housed individually, will quickly become difficult to handle and may become prone to aggressive behavior. Handle animals in a non-menacing way so they learn that you are not a threat. Realize that the duration of your experiment plays a big role in this regard; if you have to handle subjects repeatedly over many days, it is key that the subjects are comfortable with your presence and handling style. Even though many experiments only require a single handling of the subject to initiate terminal procedures, doing so with skill still makes a difference in the quality of your experimental outcome.

Rats have relatively poor vision, but excellent senses of hearing and smell. They will quickly learn to recognize you. Accordingly, talk to your subjects first, wake them up, and let them smell you before you pick them up. And because they are nocturnal, don’t be surprised if they are harder to handle during their daily dark cycle.

An old favorite approach to establish yourself as a non-threatening presence is to keep food rewards in the lab-coat pockets. Letting rats visit a dark lab-coat pocket with a few pieces of breakfast cereal or sunflower seeds makes friends fast; just be certain that this approach does not violate Institutional Animal Care and Use Committee (IACUC) standards or compromise your animals’ health protocols.

4) **Prevent distress in the first place.** With rats especially, hold the animals close to your body; allow them to explore the crook of your arm against your side, a lab-coat pocket or other dark place. When lifting them, support their body weight on their feet, and minimize the height that they are lifted above a visible surface. Hold animals firmly, but don’t squeeze. Dangling rodents by the tail at arm’s length is one of the best ways to assure that you will have to deal with dizzy, disoriented subjects that are more likely to be difficult to handle. The point is to maintain the comfort of the animal subjects rather than working to recover it after rough handling.

5) **Be quick and quiet.** Think through the process of approaching the animal, lifting, holding, and treating them before initiating the process. Avoid loud noises and sudden movements, but do move quickly and with purpose. For injections, know your target, use a sharp needle and be in and out before the animal even has time to respond before being placed back in the home cage.

6) **Keep your cool.** Don't handle animals when you are in a bad mood; wait until after the day's handling session to read grant reviews. There is no place for anger, hostility, or even brusque technique in proper animal handling. Gentleness always works better. Frustrated with how the session is going? Put it aside for a few minutes and take a break. If necessary, even change handlers and let someone who's having a better day complete the process.

7) **Outsource the stuff you don't like to do.** Don't do something poorly yourself that can be assisted or replaced by something or someone else. If you aren't comfortable restraining rodents with your own hands, use restraint devices (acrylic chambers, plastic restraint bags, etc.) that get the restrained animal out of your hands and away from you. This keeps subjects from associating you with unpleasant procedures.

Use the "good cop/bad cop" approach with the help of an assistant; this can be particularly useful if behavioral assays with frequent, repeated handling need to be combined with drug injection or other unpleasant treatment procedures.

If necessary, replace mechanical restraint with chemical restraint (although this should be adequately justified and not simply a way to avoid learning adequate handling skills).

Finally, use core services, if they are available, to put your animal-handling needs into the hands of staff that are expert and do the procedures routinely. The cost may be well worth avoiding the stress on yourself, your lab staff, and your animal subjects.

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